COMPETITIVINESS AND INNOVATION FRAMEWORK PROGRAMME

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D3.4.1: Data Fusion Tools

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About the project

FOODIE project aims at creating a platform hub on the cloud where spatial and non-spatial data related to agricultural sector is available for agri-food stakeholders groups and interoperable. It will offer: an infrastructure for the building of an interacting and collaborative network; the integration of existing open datasets related to agriculture; data publication and data linking of external agriculture data sources, providing specific and high-value applications and services for the support of planning and decision-making processes.

FOODIE project is addressed to four basic groups of users: a) stakeholders from the agriculture sector as end-users of final applications, b) public sector for communication with farmers about taxation, subsidies and regulation, c) researchers for large scale experimentation on real data and d) ICT companies for the development of new applications for agriculture and food sector, mainly using implemented tools

FOODIE specifically works on three pilots:

- Pilot 1: Precision Viticulture (Spain) will focus on the appropriate management of the inherent variability of crops,
- Pilot 2: Open Data for Strategic and Tactical Planning (Czech Republic) will focus on improving future management of agricultural companies (farms) by introducing new tools and management methods,
- Pilot 3: Technology allows integration of logistics via service providers and farm management including traceability (Germany).

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Glossary

The glossary of terms used in this deliverable can be found in the public document “FOODIE_Glossary.pdf” available at: http://www.foodie-project.eu

Abbreviations and Acronyms

Abbreviation / Acronym	Description
API	Application Programming Interface
CPU	Central Processing Unit
DBA	Database Administrator
DBaaS	Database as a Service
DDD	Domain-Driven Design
DNS	Domain Name System
GTM	Global Transaction Manager
HA	High Availability
HDD	Hard Disk Drive
HTTP	Hypertext Transfer Protocol
IaaS	Infrastructure as a Service
IDE	Integrated Development Environment
JAR	Java Archive
MPP	Massive Parallel Processing
OS	Operating System
POM	Project Object Model
RAM	Random Access Memory
RDBMS	Relational Database Management System
RDF	Resource Description Framework
SLA	Service Level Agreement
SQL	Structured Query Language
TCP	Transmission Control Protocol
TDD	Test – Driven Development
VM	Virtual Machine
API	Application Programming Interface

Table 1: Abbreviations and Acronyms

Executive Summary

This document introduces the first prototype of the data fusion tools, explaining the implementation architecture and capabilities in development.

Service overview

Data fusion tools combine data from different heterogeneous sources together to provide more efficient representation of data.

Data fusion tools aim to associate textual and/or spatial data in different structures from different sources in terms of geometry. Additionally process of data from multiple image sources is achieved by Data fusion services.

Implementation

Data fusion capabilities are served by an OGC WPS standard [1] implementation.

Data fusion WPS provides

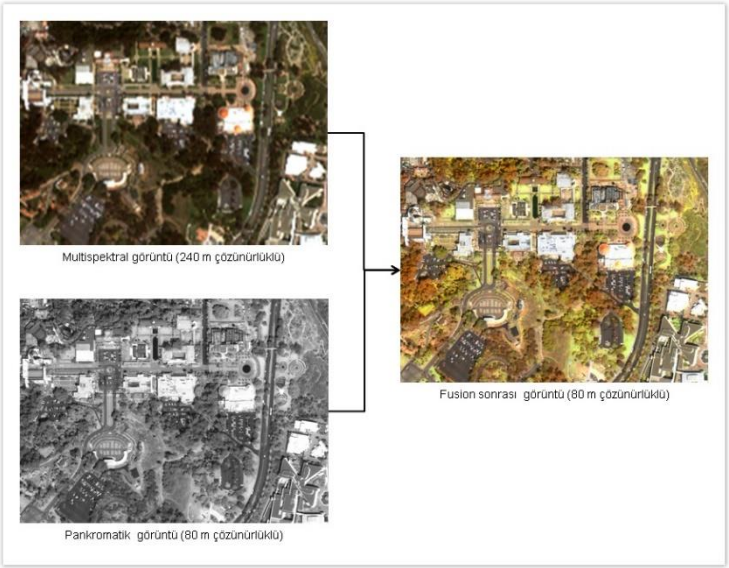
- Listing available data fusion processes.
- Getting detailed information about data fusion processes, including detailed description of inputs and outputs.
- Running data fusion processes
- Status information of running processes.

Architecture

Netcad WPS implementation is built on using several NETCAD [2] suite applications as building blocks:

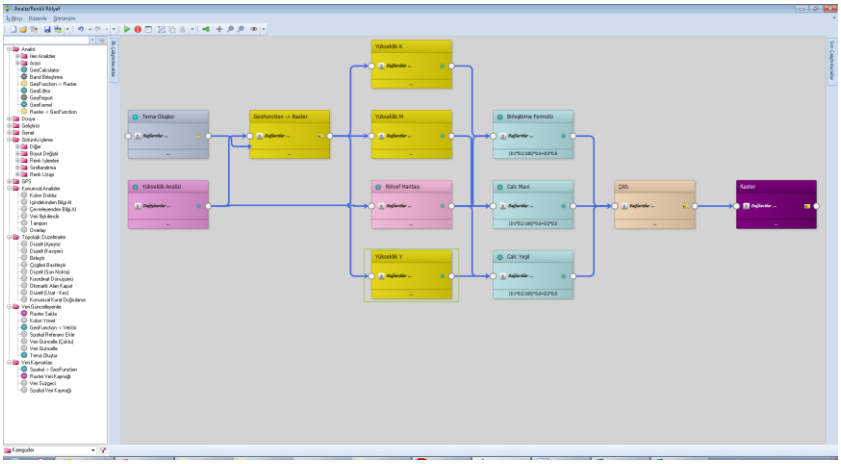
Netcad GIS: Netcad GIS is an advanced desktop application designed to be used by Engineering and GIS users especially working with maps.

Netcad Analysis Module: Netcad Analysis module is the Netcad application in which basic and advanced surface analyses, raster (image) analyses, basic and advanced spatial analyses can be performed. GIS, CAD, RS analyses are performed together interactively.



1-Analysis of multiple image sources

Netcad Architect: Netcad Architect is an application used for creating, managing and editing workflow with the help of operators. You can design your own operations with workflows and you can get outputs in a single step.



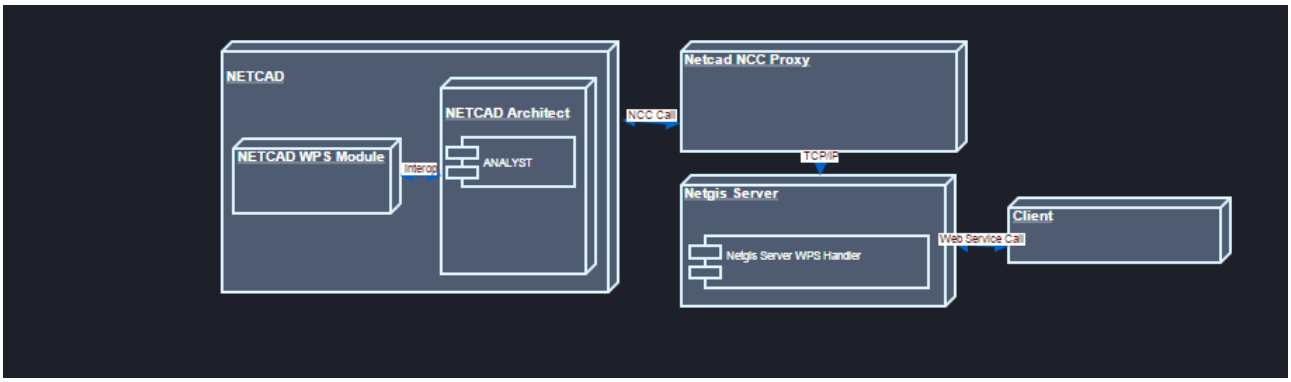
2- Workflow development with Netcad Architect

Netcad WPS Module: Netcad WPS Module is an application that accepts requests of WPS Handler and collects the results.

Netgis Server: NETGIS Server is the common name of Netcad Enterprise Solutions. NETGIS Server Family includes many components/modules. These components provide data in OGC WPS, WMS, WFS, WFC, WMTS, KML standards. The solutions are database independent.

Netgis WPS Handler: WPS handler module, as a part of Netgis server is providing online data fusion capabilities.

Netcad NCC Proxy: NCC proxy application is an integration tool for desktop and server features of Netcad Suite.



3- Data Fusion Services on Netcad Architecture

Entry point of Data fusion Services is available at: http://foodie-vm5.man.poznan.pl/netgiswps/wps.ashx?Service=WPS&Request=GetCapabilities

Development process

Fusion processes is being developed based on web enabled Workflows and Netgis WPS Handler processes. Netcad Architect workflows and operators are being developed to provide capabilities below:

- Vegetation indexes

  Indicators describing density and health of the vegetation.
- Water indexes

  Indicators describing vegetation liquid water
- SWIR indexes

  Short Wave Infrared indexes used by vegetation indexes.
- Moisture indexes

  Determination of surface moisture level.
- Computation of Time Differences of NVDI

  Difference calculation of remote sensor input.
- Contour Line Generator

  Image Processing of remote sensor input.

References

	References
01	http://www.opengeospatial.org/standards/wps
02	http://www.netcad.com/en/home